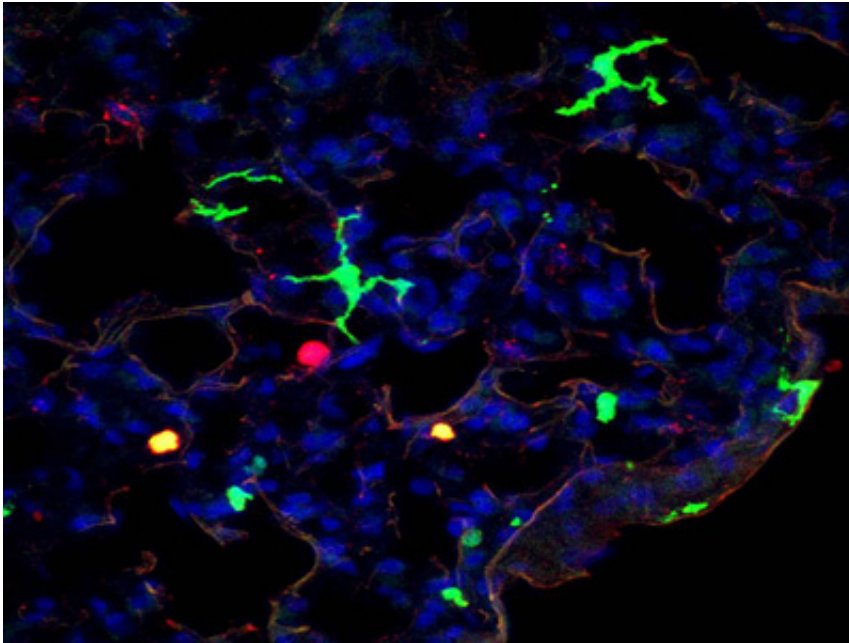


# Discovery of a new class of white blood cells uncovers target for better vaccine design

July 17 2013

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Fluorescence microscopy reveals the newly discovered CD11b+ dendritic cells (green) amongst other white blood cells (orange and red) in the lung tissue.

Credit: Peter See, A\*STAR SiGN

(Medical Xpress)—Scientists at A\*STAR's Singapore Immunology Network (SiGN) have discovered a new class of white blood cells in human lung and gut tissues that play a critical role as the first line of defence against harmful fungal and bacterial infections. This research will have significant impact on the design of vaccines and targeted immunotherapies for diseases caused by infectious microbes such as the

hospital-acquired pneumonia.

The scientists also showed for the first time that key immune functions of this new class of white blood cells are similar to those found in mice. This means that findings in the mouse studies can be applied to develop advanced clinical therapies for the [human immune system](#). The study done in collaboration with Newcastle University was published in the prestigious *Immunity* journal.

## New Class of White Blood Cell Discovered

All immune responses against infectious agents are activated and regulated by [dendritic cells](#) (DCs), a specialised group of [white blood cells](#) which present tiny fragments from micro-organisms, vaccines or tumours to the T cells. T cells are [immune cells](#) that circulate around our bodies to scan for cellular abnormalities and infections. Of the different T cells, T helper 17 (Th17) cells specialise in activating a protective response crucial for our body to eliminate [harmful bacteria](#) or fungi.

In this study, the scientists identified a new subset of DCs (named CD11b+ DCs), which are capable of activating such protective Th17 response. They also showed that mice lacking the CD11b+ DCs were unable to induce the protective Th17 response against the *Aspergillus fumigatus*, one of the most common fungal species in hospital-acquired infections.

The team leader, Dr Florent Ginhoux from SIgN said, "As dendritic cells have the unique ability to 'sense' the type of pathogen present in order to activate the appropriate immune response, they are attractive targets to explore for vaccine development. This discovery revealed fresh inroads to better exploit dendritic cells for improved vaccine design against life-threatening fungal infections."

Acting Executive Director of SIgN, Associate Professor Laurent Rénia said, "Life-threatening fungal infections have increased over the years yet treatment options remain limited. This study demonstrates how fundamental research that deepens our understanding of the body's immune system can translate into potential clinical applications that could save lives and impact healthcare."

**More information:** [www.cell.com/immunity/fulltext ...  
05-7?switch=standard](http://www.cell.com/immunity/fulltext/S0950-2688(13)00505-7?switch=standard)

Provided by Agency for Science, Technology and Research (A\*STAR), Singapore

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